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<b>Division of Forensic Science</b>  <b>IMPRESSION UNIT PROCEDURES MANUAL</b>	Amendment Designator:
	Effective Date: 31-March-2004
<p style="text-align: center;"><b>XIII KNOWN STANDARDS</b></p> <p><b>13.1 INTRODUCTION</b></p> <p>13.1.1 Laboratory preparation of known standards is a distinguishing feature of impression evidence cases as compared to other casework. The standard literature devotes extensive time to descriptions of preparation standards. Ordinarily, there is no single best process, since results depend to such a great extent upon the particular items and conditions of the specific case. Since the various techniques are not-destructive and not sequence dependent, the examiner may choose one by personal preference, and continue to apply additional techniques as necessary to maximize results. These variations in processing techniques typically do not influence the validity of the test procedure. The following list for preparation of footwear standards typifies the techniques available. Procedures listed in Footwear Impression Evidence, by William Bodziak and Tire Imprint Evidence, by Peter McDonald, will be considered as standard for footwear/tire impressions unless and until specific exceptions are listed in this section. Although the recording of known standards are listed for footwear, tire tread design can be recorded using these procedures, but no specific reference will be made to tires.</p> <p><b>13.2 PREPARATIONS</b></p> <p>13.2.1 Dental Stone</p> <ol style="list-style-type: none"> <li>1. Mix at the rate of (1) pound of dental stone to (5) ounces of water in a zip lock bag or in a plastic container that can be stirred until a pancake batter consistency is achieved (typical cast requires (2) pounds of dental stone and (10) ounces of water).</li> <li>2. No specific preparations are needed for the other standards as the materials being used are commercially prepared.</li> </ol> <p><b>13.3 MINIMUM STANDARDS AND CONTROLS</b></p> <p>The Standards and Controls for this section are to insure that the powders, dental stone and lifting materials are suitable prior to their use. Powders should be free flowing, not caked, and the lifting materials should be flexible, not rigid.</p> <p><b>13.4 PROCEDURE OR ANALYSIS</b></p> <p>Test impressions provide a recording of the characteristics already present on the outsole of a shoe. The quality of the comparison directly relates to the quality of the known.</p> <p>13.4.1 Transparent Gelatin Lifters</p> <p>A clear gelatin lifter used with a powdered or inked shoe will provide a quality impression that can be used as a transparency. The white and black gelatin lifters provide test impressions of high contrast. The qualities of the gelatin lifting materials, such as their flexibility and softness, allow for a more thorough recording of the detail of the known footwear.</p> <p>The shoes can be inked, ink rolled or dusted with powder. To ink the outsole, permanent ink of a contrasting color, usually black, is applied to a large ink pad and the shoe outsole is made to contact the ink pad. To ink roll the outsole, fingerprinting ink is rolled on a plate to smooth it out, and then rolled onto the shoe outsole evenly with an ink roller and recorded in the same manner as the permanent ink. To powder the outsole, black fingerprint powder is brushed onto the outsole and the shoe is gently shaken to remove the excess powder.</p> <p>The gel lifters come with a transparent protective cover that is removed when the impression is ready to be made. There are three ways the known impression can be made: (1) the shoe can be placed on the foot and stepped onto the gel, or (2) the shoe can be placed on a shoe iron and the gel is then rolled onto the sole of the shoe with a clean ink roller, or (3) the shoe can be rolled by hand onto the gel. When rolling the gel onto the sole, avoid stretching the gel</p>	

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<p>which would distort the impression. After the impression is made on the gel, the transparent sheet of plastic is placed back onto the gel to protect the impression. Start at the bottom, match the plastic bottom edge with the gel bottom edge and carefully roll the sheet over the gel. It is important to try to keep the bubbles to a minimum between the plastic and the gel; they may leave spots on the impression. Always mark the item number on the gel lifter which corresponds with the shoe that was used to make the impression, left or right. It is easy to get the print turned around and telling right from left becomes difficult on an unmarked transparent gel lift.</p> <p><b>13.4.2 White Gelatin Rubber Lifters</b></p> <p>The white gelatin rubber lifters are used in the same manner as the transparent gelatin lifters; however, you can not be confused by whether the shoe is right or left as it is not transparent.</p> <p><b>13.4.3 Latent Print Tape</b></p> <p>The advantages of this method are that it will give a transparent print to use as an overlay in analysis and that it can be made as light or dark as desired, like the gel lifter. The disadvantage is that it is difficult to work with. The tape is extremely tacky and possesses a static charge that will make the tape cling to any nearby object including itself; it may also produce a crease in the ball area of the foot due to the contour of the shoe. As the tape passes over the ball area of the sole, it will bunch or crease when passed over by the ink roller. The crease will distort a portion of the sole in the final impression. Despite these problems, the tape does give a good representation of the characteristics present on the sole.</p> <p>The known shoe sole can be inked or powdered (see Transparent Gelatin Lifters for procedure), the placed on the shoe iron. To get a full width representation of the shoe, it may be necessary to put two (or more as necessary) pieces of tape side by side with a small overlap. The edge of the tape is stuck to the heel of the shoe and rolled, with an ink roller, the length of the shoe. The tape is then removed and rolled onto a clear piece of plastic lengthwise. Be careful not to get too many bubbles or wrinkles between the plastic and the tape. Always mark the shoe from which the impression was made.</p> <p><b>13.4.4 Transparent (Hinge) Lifts</b></p> <p>Transparent lifts may come in two separate pieces or connected like a latent print hinge lifter. One piece is clear plastic, about the thickness of an overhead transparency. The other piece is very thin plastic with a strong adhesive on one side. The advantage to transparent lifts is that the resulting impression is a transparency and is ready to be used for overlaying the questioned impression. (See Latent Print Tape for procedure)</p> <p><b>13.4.5 Biofoam Impressions with Dental Stone</b></p> <p>Biofoam is a material that can be used to obtain three-dimensional standards. This material is a fragile foam material that deforms under minimal pressure to conform to the shape of the shoe deforming it. It is usually used to take impressions of footwear. Once an impression has been made in the biofoam, a dental stone cast can be made of that impression. A known cast make a good comparison to an unknown or crime scene cast.</p> <p>Take a biofoam container out and remove the lid. Make the impression by pressing the shoe into the biofoam or by putting the shoe on and stepping into the biofoam. Use as much pressure as you want for any given impression, avoid going through the bottom of the biofoam.</p> <p><b>13.4.5.1 Dental Stone</b></p> <p>Put dental stone powder into a gallon sized plastic bag. Use as much dental stone powder as you think is needed to fill the impression. Mix with just enough water to make the dental stone the consistency of pancake batter. Gently pour the dental stone into the biofoam impression. Carefully agitate the top layer of dental stone to try and remove any air bubbles. The dental stone needs at least one hour of drying before it should be handled and requires 24 hours to dry thoroughly. After the dental stone is</p>	

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<p align="center">dry, remove the cast from the biofoam and gently clean the cast. Using your finger and a soft brush usually cleans the cast.</p> <p><b>13.5 INSTRUMENTATION</b></p> <p>No Critical Instrumentation</p> <p><b>13.6 INTERPRETATION OF RESULTS</b></p> <p>The known standards must be an exact replication of the outsole of the known shoe to allow for a conclusive examination with the questioned impression. The known standards must be free of artifacts that could affect the examination process.</p> <p><b>13.7 REFERENCES</b></p> <ol style="list-style-type: none"> <li>1. <u>Footwear Impression Evidence</u>, Bodziak, 1990, pp 288-289, 294, 296, 302</li> <li>2. <u>Tire Imprint Evidence</u>, McDonald, 1989, pp 47-64</li> </ol>	